

EXHIBIT 3

Rodriguez et al. v. Google LLC

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA**

**ANIBAL RODRIGUEZ, SAL CATALDO,
JULIAN SANTIAGO, and SUSAN LYNN
HARVEY, individually and on behalf of all
similarly situated,**

Plaintiffs,

V.

GOOGLE LLC,

Defendant.

Case No. 3:20-cv-04688-RS

SUPPLEMENTAL REPORT OF BRUCE SCHNEIER

06 January 2025

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I. Introduction

1. I provided a report in this matter dated February 20, 2023 (“Report”) and deposition testimony on July 10, 2023.
2. After my Report and deposition, the Court granted Plaintiffs’ motion for class certification (on January 3, 2024) and issued a further order relating to the class definitions (on April 5, 2024).¹ I understand from counsel that the relevant period in this case began on July 1, 2016, and continued through September 23, 2024 (the “Class Period”). I also understand from counsel that Plaintiffs assert claims on behalf of all individuals who fit the definitions of the certified Classes (“Class Members”) based on Google’s representations and conduct during the Class Period.
3. This report does not offer any new opinions. It instead explains how the opinions stated in my Report apply to conduct and events from the portion of the Class Period that post-dates my Report (i.e., the period between February 20, 2022, and September 23, 2024). This report tracks my initial Report, with updates to the following topics only to incorporate matters post-dating my Report: (1) Data and Privacy Topics (Section II); (2) Google-Specific Topics (Section III); and (3) Google Tracking and Web & App Activity Topics (Section IV).²

II. Update to Data and Privacy Topics

4. In my Report, I offered analysis and opinions regarding certain data and privacy topics.³ I explained that activity on mobile apps is sensitive information, in part because people increasingly access the internet through mobile devices and mobile apps.⁴ Because app activity reveals intimate information about a person’s private life and daily activities, as explained in my Report, collection of app activity data has significant privacy implications.⁵
5. My opinions on these subjects have not changed. As reflected by certain developments post-dating my Report explained below, they apply equally through the end of the Class Period. I discuss below three points included in my Report where there were developments post-dating my Report that provide further support for my already-stated opinions. This is not intended to alter my opinions in any way.
6. First, in my Report, I described how Web & App Activity could be used as evidence against women who seek or obtain abortions.⁶ When I issued my Report, it had not even been a year since the United States Supreme Court overturned *Roe v. Wade*. Since my Report, states

¹ Order Granting Motion to Certify Class and Denying *Daubert* Motion, Dkt. 352; Order Granting in Part Motion to “Clarify” Class Definition, Dkt. 384.

² In preparing this supplemental report, I considered the documents identified herein and listed in Appendix 1. An updated CV is included as Appendix 2 to this report. I am compensated at the rate of \$825/hour, and my research associate, Kathleen Seidel, is compensated at a rate of \$125/hour. Our compensation does not depend upon the outcome of this litigation or the opinions expressed herein. As with my Report, I have prepared this supplement for purposes of this case only. It may not be used for any other purpose.

³ Report, § IV.

⁴ Report, § 3.6.

⁵ Report, ¶¶ 104–10.

⁶ Report, ¶¶ 105–07.

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have adopted different abortion-related laws.⁷ Actual or perceived violations of these laws may result in civil or criminal penalties.⁸ Since my Report, certain state enforcement agencies have sought to enforce abortion-related laws and restrictions. A September 2024 report by the reproductive rights organization Pregnancy Justice found that in the first year after the *Dobbs* decision, “at least 210 pregnant individuals faced criminal charges for conduct associated with pregnancy, pregnancy loss, or birth.”⁹ As one example, in April 2023, one South Carolina college student was charged with homicide following a miscarriage.¹⁰ There are other stories like this.¹¹ These developments following submission of my Report support the opinions stated in my Report regarding data privacy and the risks associated with collecting and saving Web & App Activity data.¹²

7. Second, in my Report, I explained how a person’s activity while using mobile apps can be highly personal and may reflect political beliefs.¹³ After my Report, conduct in connection with the 2024 US presidential election provided further support for my opinions regarding the sensitivity of this sort of information.¹⁴ A September 2024 study by the Public Religion Research Institute discussed that certain Americans believed that violence may be necessary or appropriate

⁷ Guttmacher Institute, “State bans on abortion through pregnancy,” <https://www.guttmacher.org/state-policy/explore/state-policies-abortion-bans> (October 7, 2024).

⁸ Human Rights & Gender Justice Clinic, CUNY School of Law et al., “Report: Criminalization and punishment for abortion, stillbirth, miscarriage, and adverse pregnancy outcomes,” https://www.law.cuny.edu/academics/clinical-programs/hrjg/projects/report-u-s-criminalization-of-abortion-and-pregnancy-outcomes/#_edn5 (September 12, 2023).

⁹ Wendy Back and Madalyn Wasilczuk, “Pregnancy as a crime: A preliminary report on the first year after *Dobbs*,” Pregnancy Justice, <https://www.pregnancyjusticeus.org/rise-of-pregnancy-criminalization-report> (September 2024); Carter Sherman, “More than 200 pregnancy-related prosecutions in first year post-Roe,” *The Guardian*, <https://www.theguardian.com/us-news/2024/sep/24/abortion-prosecutions-roe-v-wade> (September 24, 2024).

¹⁰ Kelly Rissman, “A college student lost her pregnancy. Then she was charged with homicide,” *Independent*, <https://www.independent.co.uk/news/world/americas/college-student-homicide-baby-miscarraige-b2618913.html> (September 25, 2024).

¹¹ Eleanor Klibanoff, “Texas woman charged with murder for self-induced abortion sues Starr County district attorney,” *Texas Tribune*, <https://www.texastribune.org/2024/03/30/texas-woman-sues-abortion-arrest-starr-county> (March 30, 2024); Eleanor Klibanoff, “Kate Cox’s case reveals how far Texas intends to go to enforce abortion laws,” *Texas Tribune*, <https://www.texastribune.org/2023/12/13/texas-abortion-lawsuit> (December 13, 2023); Jesus Jiménez, “Mother who gave abortion pills to teen daughter gets 2 years in prison,” *New York Times*, <https://www.nytimes.com/2023/09/22/us/jessica-burgess-abortion-pill-nebraska.html> (September 22, 2023); David Ferrara, “Greenville woman arrested for abortion has charges dismissed,” *Post and Courier*, https://www.postandcourier.com/greenville/news/abortion-south-carolina-ban-woman-arrested-charged-crime-misdemeanor-felony-fetus-baby/article_6bacd494-8e46-11ee-917a-37343a484ede.html (December 1, 2023); Remy Tumin, “Ohio woman who miscarried faces charge that she abused corpse,” *New York Times*, <https://www.nytimes.com/2024/01/03/us/brittany-watts-ohio-miscarriage-abortion.html> (January 3, 2024).

¹² Katherine Tangelakis-Lippert, “Police are prosecuting abortion seekers using their digital data—and Facebook and Google help them do it,” *Business Insider*, <https://www.businessinsider.com/police-getting-help-social-media-to-prosecute-people-seeking-abortions-2023-2> (Mar. 4, 2023); see also Cat Zakrzewski, Pranshu Verma and Claire Parker, “Texts, web searches about abortion have been used to prosecute women,” *Washington Post*, <https://www.washingtonpost.com/technology/2022/07/03/abortion-data-privacy-prosecution> (July 3, 2022) (describing investigators’ reliance on mobile search for how to “buy Misoprostol Abortion Pill Online” to support charges for “killing her infant child”).

¹³ Report, ¶ 89.

¹⁴ Jason Wilson, “Political violence in US could surge after elections, experts warn,” *The Guardian*, <https://www.theguardian.com/us-news/2024/oct/31/election-political-violence-surge> (October 31, 2024).

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to achieve political goals.¹⁵ US citizens have recently been arrested for threats of violence¹⁶ and acts of violence,¹⁷ and others have made politically motivated threats against their ideological opponents.¹⁸ Regardless of anyone's political beliefs, these post-Report developments provide further support for my opinions regarding the risk of technologies capable of facilitating widespread surveillance of citizens' political beliefs and activities.

8. Third, as I explained in my Report, data regarding ostensibly private mobile activity can be sought and used by investigators and law enforcement.¹⁹ Since my Report, additional reporting has confirmed that, with cooperation from major tech companies, law enforcement agencies have leveraged information about online activity on defendants' electronic devices to support their investigations.²⁰ As discussed *infra* (Section III), Google has continued to be a major clearinghouse for internet data and a common subpoena target. Since my Report, policymakers and the public at large have also expressed reinvigorated interest in data privacy.²¹ These issues are not limited to abortion or political activism. As detailed in my Report, privacy protections are important not only to prevent the use of personal online activity in prosecutions but also to allow people to use the internet and access apps without fear of being watched and tracked.

¹⁵ Erin Mansfield, "1 in 4 Republicans supports political violence if election is 'compromised,' study says," *USA Today*, <https://www.usatoday.com/story/news/politics/elections/2024/09/10/1-in-4-republicans-pro-political-violence/75142467007> (September 10, 2024).

¹⁶ Colleen Slevin, "A man who threatened to kill Democratic election officials pleads guilty," WEAU, <https://www.weau.com/2024/10/23/man-accused-threatening-kill-democratic-election-officials-will-likely-plead-guilty> (October 23, 2024).

¹⁷ Terry Spencer, "Teen Trump supporter in Florida charged with threatening Harris voters with machete," PBS, <https://www.pbs.org/newshour/nation/teen-trump-supporter-in-florida-charged-with-threatening-harris-voters-with-machete> (October 30, 2024).

¹⁸ Tim Balk, "Sheriff who suggested tracking Harris supporters is stripped of election role," *New York Times*, <https://www.nytimes.com/2024/09/24/us/politics/ohio-sheriff-harris-stripped.html> (September 24, 2024); Lisa Lerer and Jess Bidgood, "Trump escalates threats as campaign enters dark final stretch," *New York Times*, <https://www.nytimes.com/2024/10/26/us/politics/trump-democracy-threats.html> (October 26, 2024).

¹⁹ Report, ¶¶ 105–06, 136–41.

²⁰ Katherine Tangelakis-Lippert, "Police are prosecuting abortion seekers using their digital data—and Facebook and Google help them do it," *Business Insider*, <https://www.businessinsider.com/police-getting-help-social-media-to-prosecute-people-seeking-abortions-2023-2> (Mar. 4, 2023); *see also* Cat Zakrzewski, Pranshu Verma and Claire Parker, "Texts, web searches about abortion have been used to prosecute women," *Washington Post*, <https://www.washingtonpost.com/technology/2022/07/03/abortion-data-privacy-prosecution> (July 3, 2022) (describing investigators' reliance on mobile search for how to "buy Misoprostol Abortion Pill Online" to support charges for "killing her infant child").

²¹ Suzanne Bernstein, "The role of digital privacy in ensuring access to abortion and reproductive health care in post-*Dobbs* America," American Bar Association, https://www.americanbar.org/groups/crsj/publications/human_rights_magazine_home/technology-and-the-law/the-role-of-digital-privacy-in-ensuring-access-to-reproductive-health-care/ (June 3, 2024); Johana Bhuiyan, "Health data privacy post-Roe: can our information be used against us?" *The Guardian*, <https://www.theguardian.com/us-news/2023/jun/24/health-data-privacy-protection-ro-abortion-tech-laws> (June 24, 2023); Deborah Ross, "Ross, Lieu, Jacobs, Scholten, and Frost introduce bill to protect American's reproductive data privacy," <https://ross.house.gov/2024/3/ross-lieu-jacobs-scholten-and-frost-introduce-bill-to-protect-americans-reproductive-data-privacy> (March 28, 2024).

III. Update to Google-Specific Topics

9. In my Report, I explained that there is a fundamental conflict between Google's desire for data and its users' desire for privacy.²² The vast majority of Google's revenues in 2023 were derived from monetizing user data through advertising, just as in the years before.²³

10. Since my Report, I understand that Google has not updated its discovery responses to assert that its collection of app activity data from users who have turned off (s)WAA has changed in any way. Accordingly, I understand that Google's use of the Firebase and Google Mobile Ads SDKs to collect sensitive information from users who have turned off (s)WAA has continued after my Report and is ongoing in a way that is materially unchanged.²⁴

11. As explained in my Report, Google's collection of user data is not limited to Google apps (like Search, Gmail, and YouTube). Since my Report and through the end of the Class Period, Google continued to collect and save app activity data in connection with thousands of non-Google apps.²⁵ Mobile app usage is remarkably widespread: According to a 2024 study conducted by the Pew Research Center, 97% of US citizens own a mobile phone; nine in ten of these are smartphones, up from 35% in 2011.²⁶ In 2023, consumers used an average of 20.1 apps per month, and installed an average of 18.5 new apps per year.²⁷

12. Throughout the Class Period, Google used Google Analytics, AdMob, and Ad Manager (as incorporated in the Firebase and Google Mobile Ads SDKs) to collect and save data regarding users' activity on many non-Google apps spanning the full spectrum of mobile activity. As of September 2024 (the end of the Class Period), according to both Google's disclosures and additional research (including using the Internet Archive), non-Google apps using Google Analytics (though not disclosing that Google collects, saves, and uses (s)WAA-off data) include, for example:

²² Report, ¶ 178.

²³ Alphabet, Inc., Form 10K, U.S. Securities & Exchange Commission, <https://abc.xyz/assets/43/44/675b83d7455885c4615d848d52a4/goog-10-k-2023.pdf> at p. 35 (January 30, 2024) (reporting that of Alphabet's \$307,394,000,000 total revenues in 2023, \$237,855,000,000 were derived from advertising).

²⁴ Report, ¶¶ 183–88, 214.

²⁵ Report, ¶¶ 181–88, 206–15; Alphabet, Inc., Form 10K, U.S. Securities & Exchange Commission, <https://abc.xyz/assets/43/44/675b83d7455885c4615d848d52a4/goog-10-k-2023.pdf> at p. 35 (January 30, 2024) (shows increase in advertising revenue from \$224,473,000,000 in 2022 to \$237,855,000,000 in 2023, a total increase of \$13,382,000,000).

²⁶ Pew Research Center, "Mobile fact sheet," <https://www.pewresearch.org/internet/fact-sheet/mobile/#mobile-phone-ownership-over-time> (January 31, 2024).

²⁷ eMarketer, "Consumers are using and installing fewer smartphone apps every year," <https://www.emarketer.com/content/consumers-using-installing-fewer-mobile-apps-they-settle-on-favorites> (July 2023).

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- Employment and job search: Indeed,²⁸ Glassdoor²⁹
- Banking: Bank of America³⁰
- Medical: Cardiogram,³¹ GoodRx,³² EMAY Portable ECG Monitor,³³ my Cigna³⁴
- Psychotherapy: Headspace,³⁵ Lasting³⁶
- Weight/diet: My Diet Coach,³⁷ Bodies by Rachel,³⁸ MyFitnessPal,³⁹ Noom⁴⁰
- Sexuality: AdultFriendFinder,⁴¹ Growlr,⁴² Scruff,⁴³ Tapple,⁴⁴ Grindr,⁴⁵ Tinder⁴⁶
- Religion: YouVersion Bible App,⁴⁷ Islam360⁴⁸

²⁸ Indeed, “Privacy policy,”

<https://web.archive.org/web/20240901050952/https://hrtechprivacy.com/brands/indeed#privacypolicy> (effective August 22, 2024); Indeed, “Privacy policy,”

<https://web.archive.org/web/20191111174854/https://hrtechprivacy.com/brands/indeed#privacypolicy> (effective October 4, 2019).

²⁹ Unless otherwise noted, the source for all sites and apps in this list is Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022).

³⁰ Bank of America, “Cookie policy,”

https://www.bankofamerica.com/content/documents/privacy/Cookie_Guide_eng.pdf (last updated August 25, 2023).

³¹ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 33, 40.

³² GoodRx, “Privacy Policy,” <https://www.goodrx.com/about/privacy-policy> (September 13, 2024); GoodRx, “Privacy policy,” <https://web.archive.org/web/20220814171927/https://www.goodrx.com/about/privacy-policy> (last modified June 10, 2022).

³³ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 33, 40.

³⁴ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 35, 41.

³⁵ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 34, 41.

³⁶ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 34, 41.

³⁷ Bending Spoons, “My Diet Coach Privacy Policy,” <https://support.bendingspoons.com/privacy?app=552341639> (August 14, 2023).

³⁸ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 33, 40.

³⁹ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 35, 41.

⁴⁰ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 35, 41.

⁴¹ AdultFriendFinder, “Privacy policy,” <https://adultfriendfinder.onl/privacy-policy> (last updated July 1, 2020).

⁴² Growlr, “Growlr privacy policy,”

<https://web.archive.org/web/20170123182856/https://www.growlrapp.com/privacy> (last updated December 31, 2019); Growlr, “Growlr privacy policy,”

<https://web.archive.org/web/20240802205113/https://www.growlrapp.com/privacy> (last updated December 11, 2023).

⁴³ Perry Street Software (Scruff), “Privacy policy,”

<https://web.archive.org/web/20191105062129/https://www.perrystreet.com/privacy> (last revised October 15, 2019); Perry Street Software (Scruff), “Privacy policy,”

<https://web.archive.org/web/20231208133934/https://www.perrystreet.com/privacy> (last revised October 12, 2023).

⁴⁴ Google, “Tapple case study,” <https://firebase.google.com/case-studies/tapple> (accessed October 17, 2024).

⁴⁵ Grindr, “Third parties,” <https://www.grindr.com/privacy-policy/third-parties/en-us> (September 15, 2024); Grindr, “Third parties,” <https://www.grindr.com/privacy-policy/third-parties/en-us> (effective date June 22, 2023).

⁴⁶ Tinder, “Privacy policy,” <https://policies.tinder.com/privacy-policy-6-1-2024/intl/en/> (effective July 1, 2023);

Tinder, “Appendix to the Privacy Policy for Korean members,” <https://policies.tinder.com/sko-privacy-addendum/intl/en> (accessed October 6, 2024) (includes Firebase in list of third-party vendors with whom they share information).

⁴⁷ YouVersion, “YouVersion privacy policy,” <https://www.bible.com/privacy/20200402> (last modified April 2, 2020); YouVersion “Privacy Policy,” <https://bible.com/privacy> (August 4, 2023).

⁴⁸ Islamic Technology Mission, “Islam360 privacy policy,”

<https://web.archive.org/web/20230530112104/https://www.theislam360.com/privacy-policy.html> (archived May 30, 2023); International Technology Mission, “Privacy policy,” <https://www.theislam360.com/privacy-policy.html> (2023).

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- Cannabis: Leafly,⁴⁹ Weedmaps⁵⁰
- Gambling: California Lottery,⁵¹ Onefootball,⁵² Pokerrr 2⁵³
- Legal/probation: CaseConnect,⁵⁴ EnrolleeApp⁵⁵
- Location/transportation: Lyft,⁵⁶ Booking.com,⁵⁷ Life360,⁵⁸ ParkMobile,⁵⁹ Uber (Android only),⁶⁰ Waze⁶¹
- News: ABC (Android only),⁶² CBS (Android only),⁶³ Daily Mail Online,⁶⁴ New York Times,⁶⁵ NPR News,⁶⁶ Smartnews⁶⁷
- Reproduction/abortion: NaturalCycles,⁶⁸ Premom,⁶⁹ Planned Parenthood Direct⁷⁰
- Residential security: Nest,⁷¹ Ring (Android only)⁷²

⁴⁹ New Cannabis Ventures, “Leafly Q2 revenue increases 6% sequentially to \$12.1 million,” <https://www.newcannabisventures.com/leafly-q2-revenue-increases-6-sequentially-to-12-1-million> (August 11, 2022).

⁵⁰ Weedmaps, “Privacy policy,” <https://web.archive.org/web/20230219021453/https://weedmaps.com/legal/privacy> (effective January 30, 2023); Weedmaps, “Privacy policy,” <https://weedmaps.com/legal/privacy> (January 16, 2024).

⁵¹ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 33, 40.

⁵² Google Cloud, “Onefootball case study,” <https://firebase.google.com/case-studies/onefootball> (accessed October 17, 2024).

⁵³ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 35, 42.

⁵⁴ CaseConnect, “Privacy policy,” <https://caseconnect.com/support/privacy> (last updated June 23, 2021).

⁵⁵ Shadowtrack, “Privacy policy,” <https://www.shadowtrack.com/privacy-policy> (May 25, 2023).

⁵⁶ Google Cloud, “Lyft case study,” <https://cloud.google.com/customers/lyft> (accessed October 6, 2024); see also Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022).

⁵⁷ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 33, 40.

⁵⁸ Life360, “Privacy policy,” <https://life360-legal.zendesk.com/hc/en-us/articles/16038777217175-Life360-Privacy-Policy> (March 5, 2024).

⁵⁹ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 35, 41.

⁶⁰ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), p. 37.

⁶¹ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 37, 43.

⁶² Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), p. 32.

⁶³ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), p. 33.

⁶⁴ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 33, 40.

⁶⁵ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 36, 42.

⁶⁶ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 35, 41.

⁶⁷ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 36, 42.

⁶⁸ NaturalCycles, “Privacy policy,” <https://www.naturalcycles.com/other/legal/privacy> (last updated December 3, 2023); NaturalCycles, “Mobile app developer (Capacitor, iOS, Android),”

<https://career.naturalcycles.com/jobs/5087869-mobile-app-developer-capacitor-ios-android> (October 15, 2024).

⁶⁹ U.S. Federal Trade Commission, “Ovulation tracking app Premom will be barred from sharing health data for advertising under proposed FTC order,” <https://www.ftc.gov/news-events/news/press-releases/2023/05/ovulation-tracking-app-premom-will-be-barred-sharing-health-data-advertising-under-proposed-ftc> (May 17, 2023).

⁷⁰ Planned Parenthood Direct, “Privacy policy,” <https://www.plannedparenthooddirect.org/privacy-notice> (last updated April 15, 2024).

⁷¹ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 35, 41.

⁷² Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), p. 35.

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- Finances/crypto: Block (formerly Square),⁷³ Cash App (iOS only),⁷⁴ E*Trade,⁷⁵ MILITARY STAR Mobile,⁷⁶ PayPal,⁷⁷ Robinhood,⁷⁸ Rocket Money (formerly Truebill),⁷⁹ Stash,⁸⁰ Venmo,⁸¹ Zelle⁸²
- Messaging: Kik,⁸³ Facebook Messenger,⁸⁴ Outlook (Android only),⁸⁵ WhatsApp (Android only),⁸⁶ Yahoo! Mail (Android only)⁸⁷
- Social media: Facebook,⁸⁸ Instagram,⁸⁹ Nextdoor,⁹⁰ TikTok,⁹¹ X (formerly Twitter)⁹²

13. This list is necessarily exemplary and incomplete because, as far as I am aware, Google does not publish a complete list of apps that incorporate the Firebase or Google Mobile Ads SDKs.

14. My Report also noted that courts may order the disclosure of user data subject to a subpoena.⁹³ Since my Report, law enforcement agencies have served Google many subpoenas seeking the production of user information. According to Google, in the second half of 2023 alone, it received 63,086 requests (including but not limited to subpoenas) in the United States for disclosure of information Google classifies as “user information” (a term it does not define) involving 104,733 accounts. Google represents that it produced “user information” in response to 86% of these requests.⁹⁴ As I explained in my Report, in response to a subpoena for data regarding a user, Google may locate and produce that user’s app activity data even if they have turned (s)WAA off—as Google employees recognize.⁹⁵ And because Google does not offer

⁷³ Square, “Privacy notice for users who apply or sign up for a Square account or other services,” <https://web.archive.org/web/20230223005304/https://squareup.com/us/en/legal/general/privacy> (effective January 1, 2023); Square, “Privacy policy,” <https://squareup.com/us/en/legal/general/privacy> (July 1, 2024).

⁷⁴ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), p. 40.

⁷⁵ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 33, 40.

⁷⁶ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 35, 41.

⁷⁷ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 35, 41.

⁷⁸ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 35, 42.

⁷⁹ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 37, 43.

⁸⁰ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 36, 42.

⁸¹ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 37, 43.

⁸² Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 37, 43.

⁸³ Kik, “Privacy policy,” <https://kik.com/privacy-policy> (May 3, 2022).

⁸⁴ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 34, 40.

⁸⁵ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), p. 35.

⁸⁶ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), p. 37.

⁸⁷ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), p. 37.

⁸⁸ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 34, 40.

⁸⁹ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 34, 41.

⁹⁰ Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 35, 41.

⁹¹ TikTok, “TikTok platforms cookies policy,” <https://www.tiktok.com/legal/page/global/cookie-policy/en> (last updated November 5, 2020); TikTok, “Privacy policy,” <https://www.tiktok.com/legal/page/us/privacy-policy/en> (August 19, 2024).

⁹² Defendant Google LLC’s Interrogatories to Plaintiff Sal Cataldo, Set Four (July 14, 2022), pp. 37, 43.

⁹³ Report, ¶ 140.

⁹⁴ Google, “Global requests for user information,” Google Transparency Report, <https://transparencyreport.google.com/user-data/overview?hl=en> (2024).

⁹⁵ Report, ¶ 218.

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users any control over (s)WAA-off data, those users cannot intervene and stop Google from disclosing that (s)WAA-off data and to whom.

15. In my Report, I explained that Google’s collection of app activity data puts people at risk. My Report explained how Google has a long track record of data breaches and failures to live up to promises regarding user privacy and consent.⁹⁶ Since my Report, that track record has grown.

16. After my Report, it came to light that Google failed to follow through on a promise it made in July 2022, in the wake of the US Supreme Court’s decision in *Dobbs* to overrule *Roe v. Wade*. In July 2022, Google announced that it would delete location data indicating visits to medical facilities like counseling centers, domestic violence shelters, abortion clinics, fertility centers, weight loss clinics, and cosmetic surgery clinics soon after those visits occurred.⁹⁷

17. A May 2023 investigation found that Google was not consistently deleting sensitive location data. The reporter visited about a dozen abortion clinics, medical centers, and fertility centers around California, and “in about half of the visits, [he] watched Google retain a map of [his] activity that looked like it could have been made by a private investigator.” Although Google sometimes deleted location history, the reporter “couldn’t discern any pattern to what data Google kept and deleted.” When the issue was called to Google’s attention, Google simply repeated the promise it failed to keep.⁹⁸

18. A second study, encompassing data from seven US states, similarly found that in January 2024—eighteen months after Google promised to delete location data from visits to sensitive locations—Google continued to retain location history data for visits to abortion clinics in half of all cases tested. In half of the experiments run for the study, the name of the clinic was scrubbed from the Location History, but the route to and from the clinic and its exact location were retained.⁹⁹ These findings were cited in a January 2024 complaint to the FTC by Accountable Tech and the Electronic Privacy Information Center.¹⁰⁰

19. After my Report, Google also reneged on its promise to phase out intrusive third-party cookies in Google’s Chrome browser. In January 2020, Google announced an initiative it dubbed “Privacy Sandbox,” ostensibly a response to “user[] demand[s] [for] greater privacy” particularly

⁹⁶ Report, ¶¶ 222–48.

⁹⁷ Jen Fitzpatrick, “Protecting people’s privacy on health topics,” *The Keyword*, <https://blog.google/technology/safety-security/protecting-peoples-privacy-on-health-topics> (July 1, 2022, updated May 12, 2023).

⁹⁸ Geoffrey Fowler, “Google promised to delete sensitive data. It logged my abortion clinic visit,” *Washington Post*, <https://www.washingtonpost.com/technology/2023/05/09/google-privacy-abortion-data> (May 9, 2023).

⁹⁹ Accountable Tech, “As Google rolls out new privacy commitments, research finds company is still failing to protect privacy of abortion seekers,” <https://accountabletech.org/research/as-google-rolls-out-new-privacy-commitments-research-finds-company-is-still-failing-to-protect-privacy-of-abortion-seekers> (January 17, 2024); Johana Bhuiyan, “Google promised to delete location data on abortion clinic visits. It didn’t, study says,” *The Guardian*, <https://www.theguardian.com/technology/2024/jan/16/google-keeps-location-history-data-abortion-clinics-despite-delete-pledge> (January 16, 2024).

¹⁰⁰ Federal Trade Commission, “Complaint and request for investigation, injunction, penalties, and other relief submitted by The Electronic Privacy Information Center (EPIC) and Accountable Tech, *In the matter of Google LLC*,” <https://aboutblaw.com/bcmo> (January 18, 2024); Tonya Riley, “Google’s tracker to abortion clinics spurs complaint to FTC (1),” *Bloomberg Law*, <https://news.bloomberglaw.com/privacy-and-data-security/privacy-group-urges-ftc-to-investigate-google-location-tracking> (January 18, 2024).

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as it relates to intrusive third-party cookies, which track users across the internet. Google announced that in time, Privacy Sandbox would “render third-party cookies obsolete” without “undermining the business model of many ad-supported websites.”¹⁰¹

20. Although Google still had not completed the project in July 2022, it announced that it “intend[ed] to begin phasing out third-party cookies in Chrome in the second half of 2024.”¹⁰² Google maintained this promise in court filings as recent as June 2024.¹⁰³ Just one month later, Google did an about-face. In July 2024, Google announced that it would not deprecate third-party cookies in Chrome after all. Instead, Google now plans to develop new privacy controls and privacy control APIs that allegedly improve transparency and user control, which developers may choose to implement—or not.¹⁰⁴ This announcement reinforces Google’s commitment to the backbone of its business model: tracker-driven and targeted advertising.¹⁰⁵

21. In June 2024, 404 Media reported on an internal Google database that documented *thousands* of privacy violations involving data breaches and other unauthorized access, as internally reported by Google employees between 2013 and 2018. These are just some of the privacy incidents that surfaced for the first time in the 404 Media report¹⁰⁶:

- A filter designed to prevent Google from recording children’s voices was “not correctly applied.”
- Google-owned Waze’s carpool feature collected and retained home addresses and itineraries of carpool users.
- Contrary to Google’s policy, YouTube collected and retained users’ deleted watch history to recommend YouTube videos.
- A Google employee gained unauthorized access to Google AdWords customer accounts, which the employee used to manipulate ad tracking codes.
- If an iOS user of Google Drive or Docs chose to make a file accessible only to “Anyone with the link” to that file, Google instead treated the file as if it were “Public,” meaning that it would be made available to the public writ large, even those who had not been authorized to access it via a directed link.

22. That same month, 404 Media reported that in June 2017, an unauthorized Google contractor improperly used administrator privileges to gain access to Nintendo’s YouTube account in order to share information about a new game that was supposed to remain

¹⁰¹ Justin Schuh, “Building a more private web: A path towards making third party cookies obsolete,” *Chromium Blog*, <https://blog.chromium.org/2020/01/building-more-private-web-path-towards.html> (Jan. 14, 2020).

¹⁰² Anthony Chavez, “Expanding testing for the Privacy Sandbox for the Web,” *The Keyword*, <https://blog.google/products/chrome/update-testing-privacy-sandbox-web/> (July 27, 2022).

¹⁰³ *Brown v. Google LLC*, No. 4:20-CV-3664-YGR (N.D. Cal.), Dkt. 1111 at 9.

¹⁰⁴ Anthony Chavez, “A new path for Privacy Sandbox on the web,” *The Privacy Sandbox*, <https://privacysandbox.com/news/privacy-sandbox-update> (July 22, 2024).

¹⁰⁵ See Report, ¶¶ 178–88; Lena Cohen, “Google breaks promise to block third-party cookies,” Electronic Frontier Foundation, <https://www EFF.org/deeplinks/2024/08/google-breaks-promise-block-third-party-cookies> (August 2, 2024).

¹⁰⁶ Joseph Cox, “Google leak reveals thousands of privacy incidents,” *404 Media*, <https://www.404media.co/google-leak-reveals-thousands-of-privacy-incidents> (June 3, 2024).

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confidential.¹⁰⁷ This example illustrates that, as explained in my Report,¹⁰⁸ purportedly “confidential” user data is not necessarily safe. Unauthorized access happens, both intentionally and accidentally.

23. In March 2024, independent researchers also discovered that Firebase could be misconfigured to publicly reveal sensitive user information. As a result, 916 developers had exposed personal information about millions of users, in plain text, on the open internet. The information included 19 million passwords, as well as emails, names, phone numbers, and billing information with bank details. The researchers found this data using a script that scanned over five million domains connected to Google’s Firebase platform. Although Google could have proactively conducted similar testing to determine whether Firebase applications were improperly storing certain data, it did not.¹⁰⁹

24. In July 2024, TechRadar reported that Gemini, Google’s artificial intelligence program, improperly accessed and summarized a user’s tax return stored on Google Drive. This behavior appeared to violate the user’s privacy settings, which disabled any integration between Gemini and Google Drive. It may also violate Google’s representation that Gemini does not use files saved in Google Drive to train or improve its generative artificial intelligence services.¹¹⁰

25. This failure of privacy controls relating to Google’s AI systems—Gemini and others—is particularly alarming, as generative artificial intelligence systems depend upon incredibly large amounts of data.¹¹¹ These core machine learning (ML) models (both large-language models and image-generation models) use this data for training. Those models are then tuned for different applications. These large ML models are also less directly controlled than other, more conventional computer systems. Unlike those more conventional computer systems, ML systems are not built through rules provided by human beings. Instead, the models create their own rules and associations during the training process, using the data upon which they are trained.¹¹²

¹⁰⁷ Joseph Cox, “Google contractor used admin access to leak info from private Nintendo YouTube video,” *404 Media*, <https://www.404media.co/google-contractor-used-admin-access-to-leak-private-nintendo-youtube-video> (June 3, 2024).

¹⁰⁸ Report, §§ 5.3, 8.2–8.3.

¹⁰⁹ Ionut Ilascu, “Misconfigured Firebase instances leaked 19 million plaintext passwords,” *Bleeping Computer*, <https://www.bleepingcomputer.com/news/security/misconfigured-firebase-instances-leaked-19-million-plaintext-passwords> (March 19, 2024).

¹¹⁰ Craig Hale, “Gemini AI platform accused of scanning Google Drive files without user permission,” *TechRadar*, <https://www.techradar.com/pro/security/gemini-ai-platform-caught-scanning-google-drive-files-without-user-permission> (July 15, 2024).

¹¹¹ Erika Balla, “Here’s how much data gets used by generative AI tools for each request,” *TechTarget*, <https://www.datasciencecentral.com/heres-how-much-data-gets-used-by-generative-ai-tools-for-each-request> (November 28, 2023).

¹¹² George Lawton, “AI transparency: What is it and why do we need it?” *TechTarget*, <https://www.techtarget.com/searchcio/tip/AI-transparency-What-is-it-and-why-do-we-need-it> (September 10, 2024).

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26. This combination of AI models' voracious appetite for data and the relative lack of human control over their operations raises particularly significant risks to user privacy and security. For example, AI models have leaked private training data during the course of their operation.¹¹³

27. In June 2024, Google's Chief Privacy Officer, Keith Enright, left the company. Google reportedly has no plans to replace him.¹¹⁴

28. These developments all post-date my Report and support the opinions offered in my Report.

IV. Update to Google Tracking Web & App Activity Topics

29. In my Report, I discussed several public disclosures that Google makes, such as its Terms of Service, Privacy Policy, Google Analytics for Firebase Terms of Service, Google Analytics for Firebase Use Policy, Android settings menu, Activity Controls webpage, and "Find and control your Web & App Activity" webpage (sometimes called the "WAA Help Page"). I explained that Google promises control over the data that Google collects, saves, and uses,¹¹⁵ presents Web & App Activity as one of these controls,¹¹⁶ and promulgates key public disclosures that are difficult to read¹¹⁷ and incorporate various known dark patterns.¹¹⁸ Although Google updated certain of these disclosures since I completed my Report, my opinions remain the same for the full Class Period.

30. To update what I presented in my Report, Appendix 1 lists what I understand to be the relevant disclosures throughout the Class Period.

31. In the twenty-one months since my Report, Google amended its Terms of Service once and amended its Privacy Policy eight times.¹¹⁹ The changes to the Privacy Policy are

¹¹³ Hillai Ben-Sasson and Ronny Greenberg, "38TB of data accidentally exposed by Microsoft AI researchers," *WIZ*, <https://www.wiz.io/blog/38-terabytes-of-private-data-accidentally-exposed-by-microsoft-ai-researchers> (September 18, 2023); Tiernan Ray, "ChatGPT can leak training data, violate privacy, says Google's DeepMind," *ZDNet*, <https://www.zdnet.com/article/chatgpt-can-leak-source-data-violate-privacy-says-googles-deepmind> (December 4, 2023).

¹¹⁴ William Gavin, "Google axes its chief privacy job after series of major data leaks," *Quartz*, <https://qz.com/google-alphabet-privacy-executive-antitrust-data-leaks-1851520417> (June 6, 2024).

¹¹⁵ Report, § 9.1.

¹¹⁶ Report, § 10.1.

¹¹⁷ Report, § 9.3.

¹¹⁸ Report, § 9.4, 11.

¹¹⁹ Report, ¶¶ 274–76. The April 14, 2014 Terms of Service was the version in force at the beginning of the class period, and has been since been revised four times (October 25, 2017; March 31, 2020; January 5, 2022; and May 22, 2024). The June 28, 2016 Privacy Policy was the version in force at the beginning of the class period, and has since been revised 26 times (August 29, 2016; March 1, 2017; April 17, 2017; October 2, 2017; December 18, 2017; May 25, 2018; January 22, 2019; October 15, 2019; December 19, 2019; March 31, 2020; July 1, 2020; August 28, 2020; September 30, 2020; February 4, 2021; July 1, 2021; February 10, 2022; October 4, 2022; December 15, 2022; July 1, 2023; October 4, 2023; November 15, 2023; January 15, 2024; February 8, 2024; March 4, 2024; March 28, 2024; and September 16, 2024).

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inconsequential to my opinions, and fail to cure the dark patterns described in the Report. They do not alter my opinion that Google’s Privacy Policy exemplifies dark patterns.¹²⁰

32. Google appears to have updated the WAA Help Page at least four times since my Report was completed on February 20, 2023.¹²¹ Most of the text on this page remains the same as it was during earlier portions of the Class Period. The minor changes to the WAA Help Page—such as slight modifications to wording, and conversion of text from sentences into bulleted lists¹²²—fail to cure the dark patterns described in the Report. They do not alter my opinion that Google’s WAA Help Page exemplifies dark patterns.¹²³ Notably, none of the changes by Google address the “real problem” identified by Mr. Ruemmler back in 2019—that Google does not disclose that it collects and saves app activity when (s)WAA is turned off.

33. Google’s disclosures to app developers also remain characterized by dark patterns.¹²⁴ Since the date of my Report, Google superseded Google Analytics for Firebase, which was subject to the Google Analytics for Firebase Terms of Service¹²⁵ and Google Analytics for Firebase Use Policy,¹²⁶ with Google Analytics 4, which is subject to the Google Analytics Terms of Service.¹²⁷ While the name of the service and relevant disclosures have changed, their substance has not.

34. Like the Google Analytics for Firebase Terms of Service, the May 15, 2023, version of the Google Analytics Terms of Service, which is the most recent version, does not require developers to disclose that Google will collect users’ activity regardless of their privacy settings. There is no mention that data collection via Google services (like Google Analytics) will override the privacy controls (like (s)WAA) that Google presents to users. None of these documents disclose that Google collects and saves app activity data when (s)WAA is turned off. In that regard, the differences between the GA4 Terms of Service and GA4F Terms of Service

¹²⁰ Report, § 11.1.

¹²¹ After checking one archived instance of the WAA Help Page (<https://support.google.com/websearch/answer/54068>) per month on Archive.org, of pages archived between February 2023 and October 2024, I determined that the WAA Help Page was edited once between February 9, 2023 and September 23, 2023; once between September 23, 2023 and March 21, 2024; once between March 21, 2024 and July 19, 2024; and once between July 19, 2024 and September 6, 2024.

¹²² Google, “WAA Help Page,” Archive.org, <https://web.archive.org/web/20240321001308/https://support.google.com/accounts/answer/54068> (accessed October 22, 2024).

¹²³ Report, § 11.1.

¹²⁴ Report, § 11.6.

¹²⁵ Google, “Google Analytics for Firebase Terms of Service,” <https://firebase.google.com/terms/analytics> (last modified April 12, 2023). The May 18, 2016 Google Analytics for Firebase Terms of Service was the version in force at the beginning of the class period, and was revised three times (May 17, 2017; October 1, 2018; and April 17, 2019) before the discontinuation of GA4F properties on April 12, 2023.

¹²⁶ Google, “Google Analytics for Firebase Use Policy,” <https://firebase.google.com/policies/analytics> (last modified April 12, 2023). The May 18, 2016 Google Analytics for Firebase Use Policy was the version in force at the beginning of the class period, and was revised twice (May 17, 2017 and December 20, 2019) before the discontinuation of GA4F properties on April 12, 2023.

¹²⁷ Google, “Google Analytics Terms of Service,” <https://marketingplatform.google.com/about/analytics/terms/us/> (last updated May 15, 2023). The March 31, 2021 Google Analytics Terms of Service was the version in force on April 12, 2023, when GA4F properties were discontinued and developers encouraged to migrate to Google Analytics 4. The GA4 TOS has since been revised once, on May 15, 2023).

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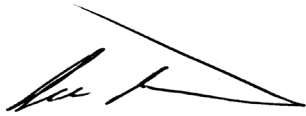
and Use Policy are inconsequential to my opinion that Google's disclosure to app developers exemplifies dark patterns.

35. In my Report, I also discussed the congressional testimony offered by Google's CEO, Sundar Pichai.¹²⁸ To my knowledge, Google has not yet corrected Mr. Pichai's testimony.

V. Conclusion

36. In sum, developments since my Report was finalized and through the end of the Class Period support the opinions I expressed in my Report.

Respectfully submitted by,

A handwritten signature in black ink, appearing to read 'Bruce Schneier', with a long horizontal line extending to the right.

Bruce Schneier

Date: 06 January 2025

¹²⁸ Report, ¶¶ 254–55, 348–350.